

Remarks

The above Amendments and these Remarks are in reply to the Office Action mailed September 16, 2002. Claims 1-11 were pending in the Application prior to the outstanding Office Action. In the Office Action, claims 1-11 were rejected under 35 U.S.C. §112, second paragraph. Claims 2, and 8-11 were rejected under 35 U.S.C. §103(a). Claims 1, and 3-7 were rejected under 35 U.S.C. §102(b) or, in the alternative, under 35 U.S.C. §103(a).

I. RESPONSE TO REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH

In paragraph 4 of the Office Action mailed September 16, 2002, the Examiner rejected claims 1-11 under 35 U.S.C. §112, second paragraph.

A. Independent Claim 1

The Examiner rejected claim 1, maintaining that the phrase "around within" is unclear. Applicants have amended claim 1. The phrase "around within" is no longer recited in claim 1. Therefore, Applicants respectfully assert that claim 1 meets the requirements set forth in 35 U.S.C. §112, second paragraph.

B. Dependent Claims 2-5

Dependent claims 2-5 depend directly or indirectly from independent claim 1. These dependent claims include all of the limitations of the independent claim from which it depends. Applicants have amended claim 1 to meet the requirements set forth in 35 U.S.C. §112, second paragraph, and therefore, dependent claims 2-5 also meet the requirements set forth by 35 U.S.C. §112, second paragraph.

C. Dependent Claims 6-7

The Examiner rejected claims 6-7, maintaining that "said ... stocker" should be -- said one or more ... stockers --. Applicants have amended claims 6-7 by incorporating the Examiner's suggestion. Therefore, Applicants respectfully assert that claims 6-7 meet the requirements set forth in 35 U.S.C. §112, second paragraph.

D. Independent Claim 8

The Examiner rejected claim 8, maintaining that the phrase “around within” is unclear, and the phrase “easy removal” is vague and subjective. Applicants have amended claim 8 such that the phrases “easy removal” and “around within” are no longer recited in claim 8. Therefore, Applicants respectfully assert that claim 8 meets the requirements set forth in 35 U.S.C. §112, second paragraph.

E. Dependent Claim 9

Dependent claim 9 depends directly or indirectly from independent claim 8. This dependent claim includes all of the limitations of the independent claim from which it depends. Applicants have amended claim 8 to meet the requirements set forth in 35 U.S.C. §112, second paragraph, and therefore, dependent claims 9 also meets the requirements set forth by 35 U.S.C. §112, second paragraph.

F. Dependent Claims 10-11

The Examiner rejected claims 10-11, maintaining that “said … stocker” should be -- said one or more … stockers --. Applicants have amended claims 10-11 by incorporating the Examiner’s suggestion. Therefore, Applicants respectfully assert that claims 10-11 meet the requirements set forth in 35 U.S.C. §112, second paragraph.

G. Dependent Claim 12

Dependent claim 12 depends directly or indirectly from independent claim 8. This dependent claim includes all of the limitations of the independent claim from which it depends. Applicants have amended claim 8 to meet the requirements set forth in 35 U.S.C. §112, second paragraph, and therefore, dependent claims 12 also meets the requirements set forth by 35 U.S.C. §112, second paragraph.

II. RESPONSE TO REJECTIONS UNDER 35 U.S.C. §102(b)

In paragraph 7 of the Office Action mailed September 16, 2002, the Examiner rejected claims 1, and 3-7 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,999,671 issued to *Iizuka* ("*Iizuka*").

Iizuka discloses a reticle conveying device that transfers cassettes 4 between a cassette library 2 and an air-conditioned chamber 1. Each cassette 4 contains a single reticle 6. The cassettes 4 are vertically stacked in the cassette library 2 while waiting to be transferred to the air-conditioned chamber 1. *Iizuka*, Figs. 1-4. The cassette 4 is placed on a reticle extracting station P3 when transferred into the air-conditioned chamber 1. The reticle extracting station P3 opens the cassette 4. An extracting fork 30 then removes the reticle 6 from the cassette 4 and transports the reticle 6 to either an inspection or exposure station. Once the inspection or exposure process is completed, the reticle 6 is inserted back into the cassette 4, the cassette 4 is closed, and the cassette 4 is transferred back into the library 2. The device disclosed in *Iizuka* cannot store a reticle 6 unless the reticle 6 is within a cassette 4.

A. Independent Claim 1 Patently Distinguishes over *Iizuka*

Amended claim 1 recites a stocker "capable of storing a workpiece that has been removed from the container." The device disclosed in *Iizuka* cannot store a reticle 6 once it has been removed from a cassette 4. As shown in Figs. 1-4 of *Iizuka*, the device stores cassettes 4 within the cassette library 2. The cassette library 2 is only capable of storing cassettes 4 – the device disclosed in *Iizuka* does not store reticles. The cassette library 2 in *Iizuka* has an elevator mechanism with multiple shelves. Each shelf is designed to engage the cassette holder 5 on the bottom of the cassette 4 and hold the cassette holder 5 in place between two arrays of rolls 23 and 25. The elevator mechanism cannot support or hold a reticle 6 in place. Therefore, Applicants respectfully assert that amended claim 1 is not anticipated by *Iizuka*.

B. Dependent Claims 2-7 Patently Distinguish over *Iizuka*

Dependent claims 2-7 depend directly or indirectly from independent claim 1. These dependent claims include all of the limitations of the independent claim from

which it depends. Applicants respectfully request that dependent claims 2-7 be allowed for at least the reasons set forth above from independent claim 1.

C. Independent Claim 8 Patently Distinguishes over *Iizuka*

Amended claim 8 recites a stocker that has “a plurality of annular carousels [that have] multiple substantially radially oriented slots extending outward from said rotatable central shaft such that said slots store a reticle in a substantially vertical orientation.” As previously discussed above, the device disclosed in *Iizuka* stores cassettes 4 in the cassette library 2 – the device disclosed in *Iizuka* does not store reticles. Fig. 5 of *Iizuka* illustrates that the elevator mechanism located within the cassette library 2 vertically stacks the cassettes 4. Each cassette 4 is stored in the cassette library 2 in a horizontal orientation. Fig. 3 of *Iizuka* illustrates that the reticle 6 stored within the cassette 4 is therefore also maintained in a horizontal orientation. The structure recited in claim 8 provides numerous advantages over the device disclosed in *Iizuka*. For example, the present invention eliminates the need to open and close a cassette every time a reticle must be transferred.

Furthermore, amended claim 8 recites a reticle stocker that includes “a fan filter unit that circulates clean air by the reticles seated in said slots.” The cassette library 2 in *Iizuka* does not include a fan filter unit. Even if the cassette library 2 did contain a fan filter unit, the air circulated within the cassette library would not pass by each reticle 6 since each reticle 6 is enclosed within a cassette 4. Therefore, Applicants respectfully assert that claim 8 is not anticipated by *Iizuka*.

D. Dependent Claims 9-11 Patently Distinguish over “*Iizuka*”

Dependent claims 9-11 depend directly or indirectly from independent claim 8. These dependent claims include all of the limitations of the independent claim from which it depends. Applicants respectfully request that dependent claims 9-11 allowed for at least the reasons set forth above from independent claim 8.

III. RESPONSE TO REJECTIONS UNDER 35 U.S.C. §103(a)

In paragraphs 7, 8, and 9 of the Office Action mailed September 16, 2002, the Examiner rejected claims 1-11 under 35 U.S.C. §103(a) as being unpatentable over multiple combinations of the following references:

- U.S. Patent No. 4,999,671 issued to *Iizuka* ("*Iizuka*");
- U.S. Patent No. 5,972,727 issued to *Ryan* ("*Ryan*"); and
- U.S. Patent No. 4,867,629 issued to *Iwasawa* et al. ("*Iwasawa*").

The device disclosed in *Iizuka* has previously been discussed above.

Ryan discloses a reticle sorter 300 that includes multiple docking stations 310, an arm 330, and a reticle docking location 350. Each docking station is capable of holding a cassette 320. The arm 330 is "capable of retrieving the reticles 324 from and inserting the reticles 324 into the slots in order to sort the reticles 324 within each cassette." *Ryan*, col. 3, line 66 – col. 4, line 1. The reticle docking location 350 "provides a temporary holding place for a reticle 324 in the event reticles must be sorted and each cassette 320 within the reticle sorter 300 is full." *Ryan*, col. 4, lines 15-17. The reticle docking location 350 can only store one reticle at a time. The sorter 300 does not store individual reticles 324 – the sorter simply moves reticles between cassettes.

Iwasawa discloses a dust-tight storage cabinet that stores wafer cassettes 44. The wafer cassettes 44 pass into and out of the cabinet through a single entrance 48. *Iwasawa*, Figs. 2-3. The size of the entrance 48 is so small that only one cassette 44 can pass into or out of the cabinet at a time. After a cassette 44 passes through the entrance 48, the cassette 44 is temporarily stored on a horizontal plate 94. A transfer mechanism 96 located within the cabinet transfers the cassettes 44 between the horizontal plate 94 and a cassette compartment 92. As shown in Figs. 2-3 of *Iwasawa*, each cassette compartment 92 is defined by a vertical support structure 86 and multiple support shelves 88 that extend from the vertical support structure 86. In other words, the support structure 86 and shelves 88 create multiple co-axially aligned circular shelves for storing cassettes 44 – the cassette compartments 92 open radially outwards. The shelves are rotated by a center shaft 70 so that the transfer mechanism 96 may access any of the cassette compartments 92.

A. *Iizuka*

The Examiner rejected claims 1, and 3-7 as being obvious over *Iizuka*.

1. Independent Claim 1 Patently Distinguishes over *Iizuka*

As previously discussed above, amended claim 1 recites a stocker “capable of storing a workpiece that has been removed from the container.” *Iizuka* provides no motivation to store a reticle 6 in the cassette library 2 unless the reticle 6 is first enclosed within a cassette 4. According to *Iizuka*, “each reticle 6 is conveyed while being kept in a corresponding cassette 4.” *Iizuka*, col. 6, lines 60-62. Further, *Iizuka* states that “[a] plurality of cassettes 44 are kept in the reticle cassettes library 2 ... in a layered fashion.” *Iizuka*, col. 4, line 67 – col. 5, line 1. *Iizuka* never mentions or suggests that (1) a reticle can be transferred between the library 2 and the chamber 1 without being enclosed within a cassette 4, or (2) the library 2 can store a reticle 6 without being enclosed within a cassette 4. Therefore, Applicants respectfully assert that claim 1 is not obvious in view of *Iizuka*.

2. Dependent Claims 3-7 Patently Distinguish over *Iizuka*

Dependent claims 3-7 depend directly or indirectly from independent claim 1. These dependent claims include all of the limitations of the independent claim from which it depends. Applicants respectfully request that dependent claims 3-7 be allowed for at least the reasons set forth above from independent claim 1.

B. *Iizuka* in view of *Ryan*

The Examiner rejected claim 2 as being obvious over *Iizuka* in view of *Ryan*. Claim 2 has been amended to recite that the “stockers store workpieces in a substantially vertical orientation.” Claim 2 depends directly from independent claim 1, and therefore, includes all of the limitations from claim 1. As previously discussed above, claim 1 is not obvious in view of *Iizuka* because *Iizuka* provides no motivation or suggestion to store a reticle 6 in the cassette library 2 without being enclosed in a cassette 4. Therefore, claim 2 is not obvious in view of *Iizuka*.

In addition, the cassette library 2 in *Iizuka* stores the reticles 6 in a horizontal orientation. The present invention’s ability to store workpieces vertically provides an

advantage over the cassette library 2 in *Iizuka*. As is known within the semiconductor manufacturing industry, footprint space within a wafer fabrication facility is at a premium. Storing individual reticles in a substantially vertical orientation allows the stocker of the present invention to place the reticles close together and create a high-density storage unit. In *Iizuka*, the reticles 6 cannot be stacked together any closer than the width of a cassette 4 – the device disclosed in *Iizuka* cannot create the storage density of the invention recited in claim 2. Therefore, claim 2 is not obvious over *Iizuka*.

Moreover, claim 2 is not obvious in view of *Ryan*. *Ryan* discloses a reticle docking location 350 that can temporarily store a single reticle. The reticle docking location 350 is a shelf. A reticle placed on the reticle docking station 350 is supported in a horizontal orientation. Therefore, claim 2 is not obvious in view of *Iizuka*, in view of *Ryan*, either alone or in combination.

C. *Iizuka* in view of *Iwasawa*

The Examiner rejected claims 8-11 as being obvious over *Iizuka* in view of *Iwasawa*.

1. Independent Claim 8 Patently Distinguishes over *Iizuka* in view of *Iwasawa*

Claim 8 recites stockers that have “multiple substantially radially oriented slots extending outward from said rotatable central shaft such that said slots store a reticle in a substantially vertical orientation.” The cassette library 2 disclosed in *Iizuka* stores reticles 6. However, the cassette library 2 only stores reticles 6 that are enclosed in cassettes 4. The cassettes 4 are vertically stacked on an elevator mechanism. The shelves of the elevator mechanism must be separated by at least the height of a cassette 4 in order to allow each cassette 4 to fit in between the shelves. The stockers recited in claim 8 store reticles closer together than the cassette library 2 in *Iizuka* – creating a more space efficient environment. Further, the device disclosed in *Iizuka* must open a cassette 4 to access the reticle 6. The stockers recited in claim 8 store the workpieces after being removed from a container, eliminating having to open and close a container every time a reticle must be accessed. The present invention as recited in claim 8 increases the throughput and storage capability of the stocker over the device disclosed in *Iizuka*.

Moreover, the cabinet disclosed in *Iwasawa* stores cassettes 44 in compartments 92. *Iwasawa* does disclose multiple co-axially aligned circular shelves. However, the shelves support cassettes 44, not individual wafers. The "substantially radially oriented slots" recited in claim 8 stores individual workpieces. Therefore, the "annular carousels" recited in claim 8 stores more workpieces than the circular shelves disclosed in *Iwasawa*. The present invention's ability to store a large number of workpieces within a small footprint saves valuable space with a wafer fabrication facility where footprint size is at a premium. Therefore, claim 8 is not obvious over *Iizuka* in view of *Iwasawa*, either alone or in combination.

2. Dependent Claims 9-11 Patently Distinguish over *Iizuka* in view of *Iwasawa*

Dependent claims 9-11 depend directly or indirectly from independent claim 8. These dependent claims include all of the limitations of the independent claim from which it depends. Applicants respectfully request that dependent claims 9-11 be allowed for at least the reasons set forth above from independent claim 8.

Other Remarks

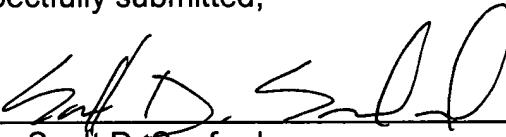
The references cited by the Examiner but not relied upon have been reviewed, but are not believed to render the claims unpatentable, either singly or in combination.

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-0639 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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APPENDIX

As required by 37 C.F.R. §1.121(b)(ii), marked-up copies of the claims amended in this Response are provided below with insertions underlined and deletions bracketed.

Claim 9 has been cancelled.

1. ~~A reticle management system, comprising:~~ **(Once Amended) A workpiece management system for storing and transferring workpieces within an environment that is isolated from ambient conditions, comprising:**

~~one or more load ports for transferring reticles into and out of the reticle management system; a load port assembly adapted to support a container having a container door and a container shell, said load port assembly being capable of separating the container door from the container shell to provide access to workpieces supported by a cassette located within the container;~~

~~one or more bare reticle stockers capable of storing a plurality of reticles, a bare reticle stocker of said one or more bare reticle stockers capable of easy removal from and inclusion in the reticle management system.~~ **at least two stockers, said stockers being capable of storing a workpiece that has been removed from the container; and**

a workpiece transfer mechanism for transferring workpieces between said stockers and a container.

2. **(Once Amended) A reticle management system as recited in claim 1, wherein said one or more load ports comprise at least two load ports, the reticle management system utilizing the at least two load ports for reticle sorting.** **A workpiece management system as recited in claim 1, wherein said stockers store workpieces in a substantially vertical orientation.**

3. **(Once Amended) A reticle workpiece management system as recited in claim 1, wherein said one or more bare reticle stockers in the reticle workpiece management system may be varied between one and six.**

4. **(Once Amended)** A reticle workpiece management system as recited in claim 1, wherein said ~~one or more bare reticle stockers~~ in the reticle workpiece management system may be varied between one and eight.

5. **(Once Amended)** A reticle workpiece management system as recited in claim 1, wherein said ~~one or more bare reticle stockers~~ in the reticle workpiece management system may be varied between one and twelve.

6. **(Once Amended)** A reticle workpiece management system as recited in claim 1, wherein said bare reticle stocker stockers may be stored remotely from the workpiece management system.

7. **(Once Amended)** A reticle workpiece management system as recited in claim 1, wherein said bare reticle stocker stockers may be used for bulk transport of reticles workpieces away from the reticles workpiece management system.

8. **(Once Amended)** A reticle management system, comprising:

~~one or more load ports for transferring reticles into and out of the reticle management system; a load port assembly being capable of supporting a SMIF pod having a pod door and a pod shell, and being adapted to separate the pod door from the pod shell to provide access to the reticles contained within the SMIF pod;~~ *N/H*

~~a reticle transfer mechanism for transferring reticles around within the reticle management system; and~~

~~one or more bare reticle stockers capable of storing a plurality of reticles, a bare reticle stocker of said one or more bare reticle stockers including a plurality of stacked, annular carousels, said stacked, annular carousels including a plurality of radially oriented slots for storing reticles in vertical orientation;~~

~~a fan filter unit for circulating air through a center of said carousels and out of said slots past the reticles.~~

at least two reticle stockers capable of storing a plurality of reticles that have been removed from the SMIF pod, said reticle stockers including:

a rotatable central shaft;

a plurality of annular carousels, each said annular carousel being coaxially aligned with and secured to said rotatable central shaft, and having multiple substantially radially oriented slots extending outward from said rotatable central shaft such that said slots store a reticle in a substantially vertical orientation; and

a fan filter unit that circulates clean air by reticles seated in said slots; and

a reticle transfer mechanism for transferring reticles between said reticle stockers and the SMIF pod.

10. (Once Amended) A reticle management system as recited in claim 1, 8, wherein said bare reticle stocker stockers may be stored remotely from the reticle management system.

11. (Once Amended) A reticle management system as recited in claim 1, 8, wherein said bare reticle stocker stockers may be used for bulk transport of reticles away from the reticle management system.

SF1:483487.2